

Table 1
Video Game Higher Order Thinking Evaluation Rubric

Characteristics	Y/N 1/0
Requires users to assume a role in the game, rather than simply play.	
Offers meaningful interaction such as dialogue with NPCs.	
Has a storyline.	
Has a complex storyline with characters users care about.	
Offers simple puzzles.	
Has complex puzzles requiring effort to solve.	
Uses three-dimensional graphics.	
Allows multiple views or camera pans and the ability to zoom in and out.	
Allows different ways to complete the game.	
Simulates complex processes requiring adjustment of variables by users to obtain desired results or adjusting variables leads to different results.	
Allows interaction through use of avatars.	
Avatars are lifelike.	
Requires interaction with virtual elements within the game.	
Requires knowledge of game elements beyond mouse prompts, number entry (e.g., combining elements to create new tools, understanding complex jargon).	
Requires gathering of information in order to complete.	
Requires synthesis of knowledge in order to complete or successfully engage elements in the game.	
Environment effectively replicates real world.	
NPCs display AI characteristics.	
NPCs display effective use of AI resulting in dynamic experiences for the user.	
Offers replay ability with varying results.	
Total score: (Indicating placement on the Video Game Cognitive Viability Index)	

Table 2
Video Game Cognitive Viability Scale

20	<i>Perfect score.</i> Game displays highest elements of cognitive viability.
15-19	<i>Upper-range.</i> Game holds several positive characteristics lending itself to higher order thinking.
14-18	<i>Mid-range.</i> Game is probably acceptable for some higher order thinking opportunities.
9-13	<i>Lower-range.</i> Fewer opportunities for higher order thinking will take place in the game.
0-8	<i>Little or no cognitive viability.</i> Typical score range for arcade-style only games.

Upon evaluating a video gaming product, teachers should answer the yes/no indicators in the rubric with a 1 for yes and a 0 for no. A game earning a perfect score would earn a 20. The higher a game scores on the index, the more opportunities the game will afford users higher order thinking, while the opposite is true for lower scores. Following are more details on the components of the rubric along with an explanation of the rationale behind the evaluating factors. Note that the examples of specific games, where provided, do not necessarily indicate the game would score high on the index. Rather, the examples indicate where a game would score a particular point on the rubric, and are only included for illustrative purposes for that particular portion of the rubric.

RATIONALE FOR RUBRIC COMPONENTS IN TABLE 1

Requires users to assume a role in the game, rather than simply play.
Requiring users to assume some sort of role typically offers increased opportunities for higher order thinking. Users will engage in additional cognitive processing when role play is involved because it forces them to process information outside their normal experiences. Rearranging knowledge into cognitive patterns is a key tenet of Gestalt psychology (Alberto & Troutman, 2003). Role playing often forces users to engage in analysis, in which they must interpret elements in the game according to the role they are playing; synthesis, in which they must apply concepts to a new setting (the role they